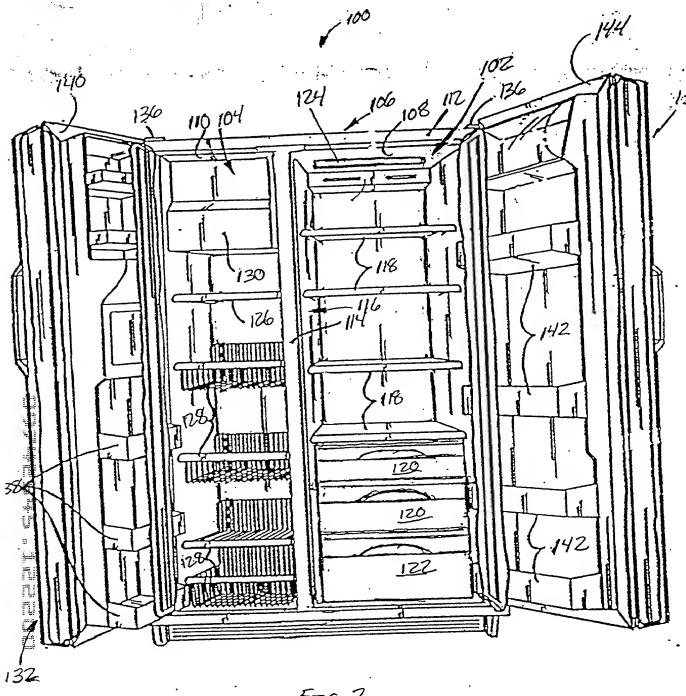

100
144
140
102
124
106
108
112
136
134
136
110
104
130
126
114
116
118
142
128
120
120
142
122
128
138
132

FIG. 2

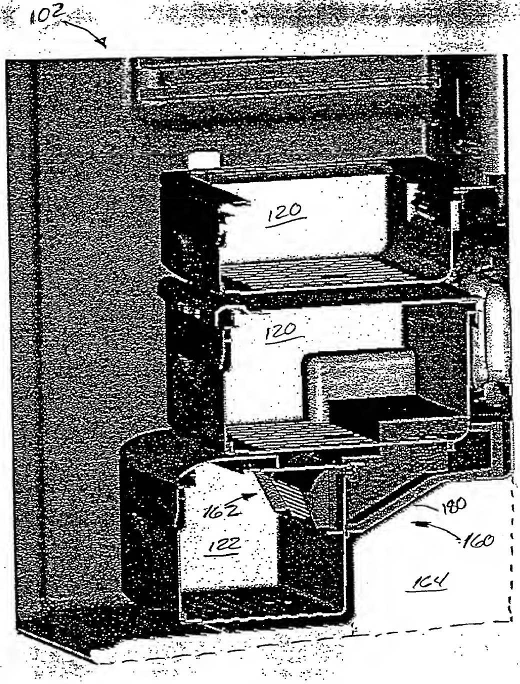


FIG. 2

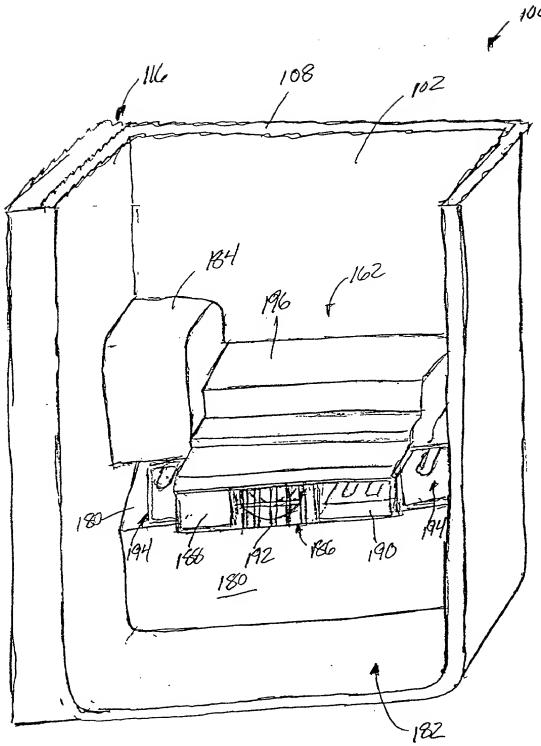


FIG. 3

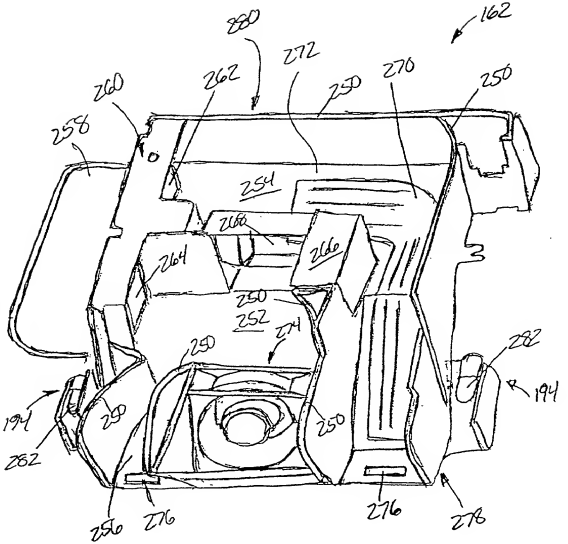


FIG. 4

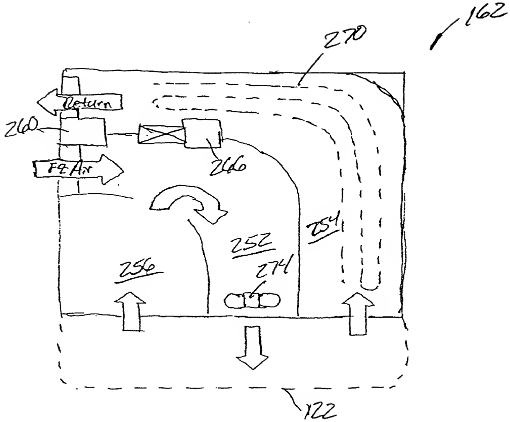


FIG. 5

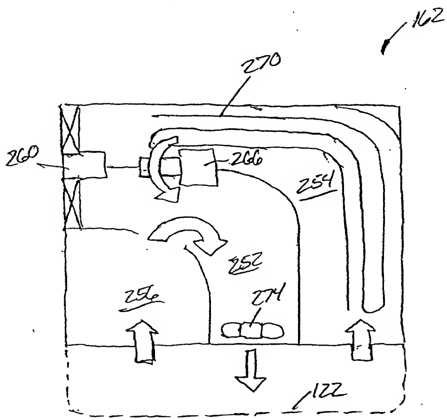


FIG. 6

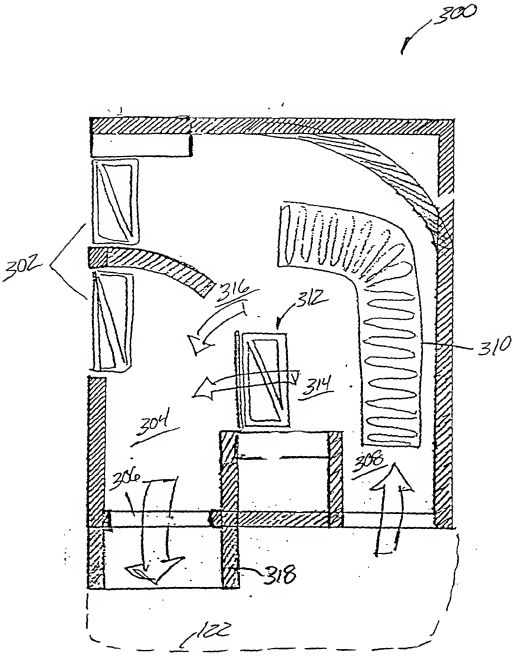


FIG. 7

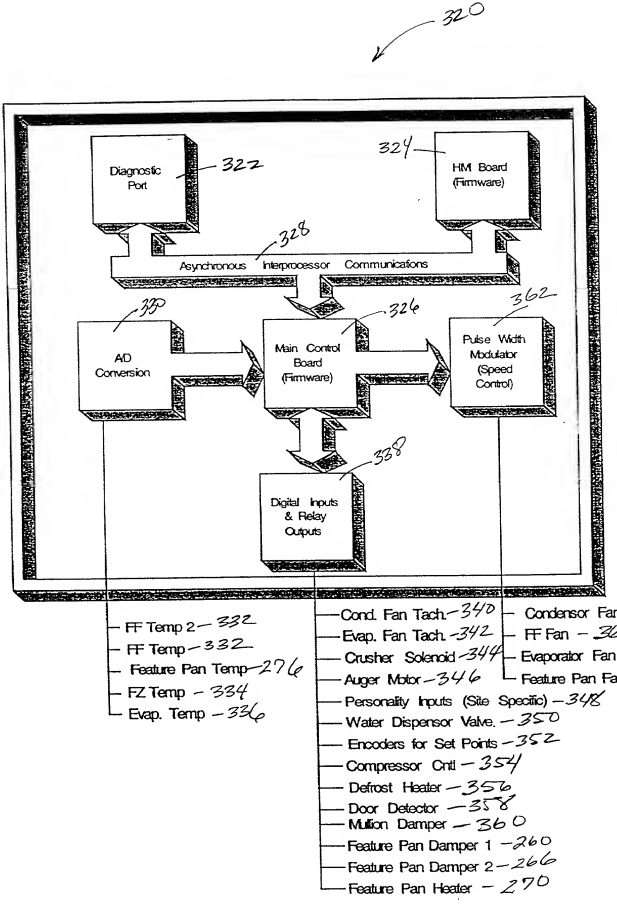

320
Diagnostic Port
322
HM Board (Firmware)
324
Asynchronous Interprocessor Communications
328
AD Conversion
330
Main Control Board (Firmware)
326
Pulse Width Modulator (Speed Control)
362
Digital Inputs & Relay Outputs
338
FF Temp 2 – 332
FF Temp – 332
Feature Pan Temp – 276
FZ Temp – 334
Evap. Temp – 336
Cond. Fan Tach. – 340
Evap. Fan Tach. – 342
Crusher Solenoid – 344
Auger Motor – 346
Personality Inputs (Site Specific) – 348
Water Dispensor Valve. – 350
Encoders for Set Points – 352
Compressor Cntl – 354
Defrost Heater – 356
Door Detector – 358
Mullion Damper – 360
Feature Pan Damper 1 – 260
Feature Pan Damper 2 – 266
Feature Pan Heater – 270
Condensor Fan – 364
FF Fan – 366
Evaporator Fan – 368
Feature Pan Fan – 274

FIG. 8

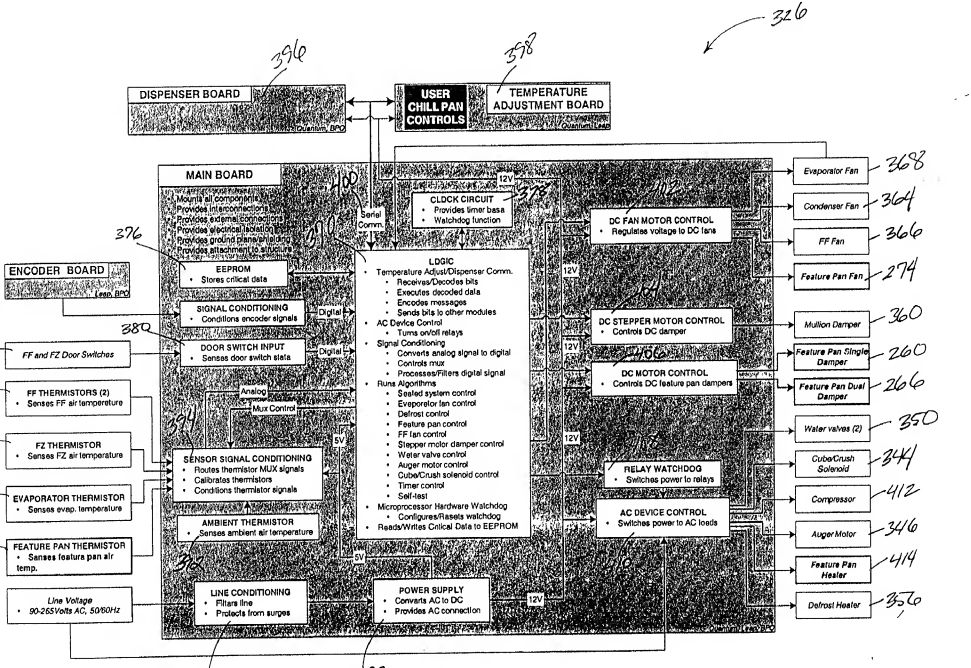


FIG. 9

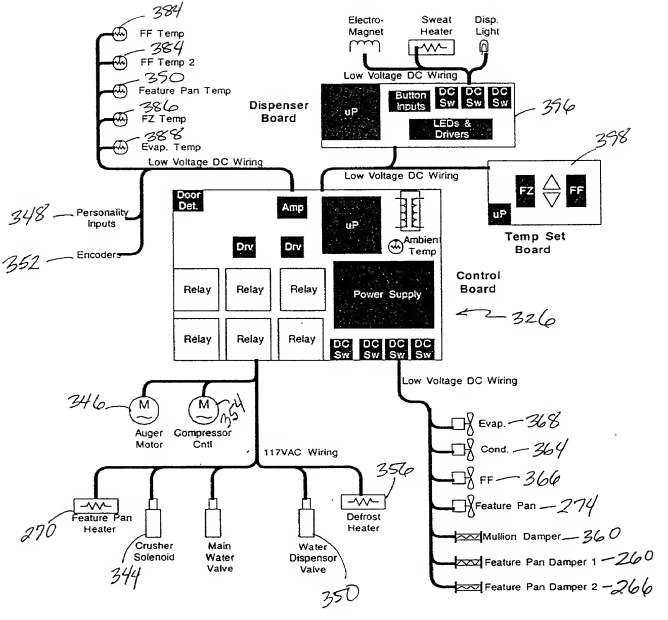

384
FF Temp
384
FF Temp 2
350
Feature Pan Temp
386
FZ Temp
388
Evap. Temp
Low Voltage DC Wiring
Dispenser Board
Electro-Magnet
Sweat Heater
Disp. Light
Low Voltage DC Wiring
uP
Button Inputs
DC Sw
DC Sw
DC Sw
LEDs & Drivers
356
398
Low Voltage DC Wiring
FZ
FF
uP
Temp Set Board
348
Personality Inputs
352
Encoders
Door Det.
Amp
uP
Ambient Temp
Drv
Drv
Relay
Relay
Relay
Relay
Relay
Relay
Power Supply
DC Sw
DC Sw
DC Sw
DC Sw
Control Board
326
Low Voltage DC Wiring
346
M
Auger Motor
M
Compressor Cntl
354
117VAC Wiring
358
Evap. 368
Cond. 364
FF 366
Feature Pan 274
Mullion Damper 360
Feature Pan Damper 1 260
Feature Pan Damper 2 266
Feature Pan Heater
270
Crusher Solenoid
344
Main Water Valve
Water Dispensor Valve
350
Defrost Heater

Fig 10

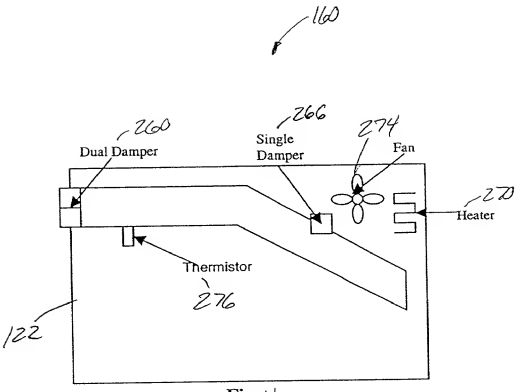


Fig. 11

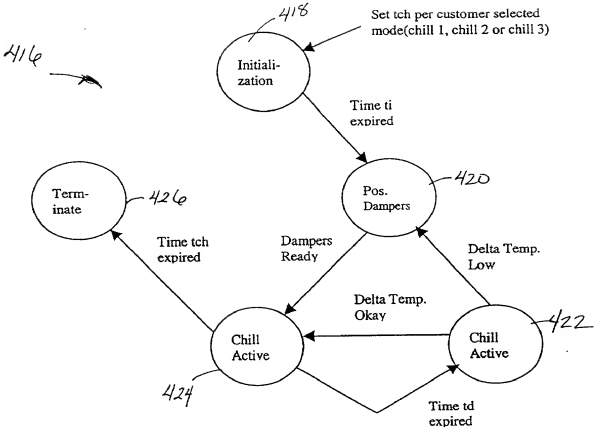
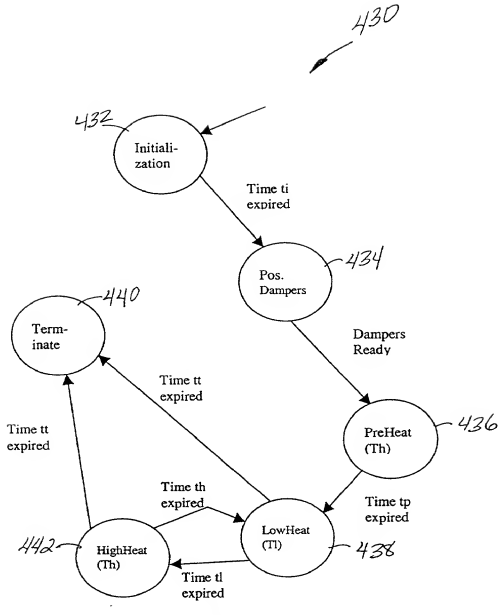

416
418
Set tch per customer selected mode(chill 1, chill 2 or chill 3)
Initiali-zation
Time ti expired
Pos. Dampers
420
Term-inate
426
Time tch expired
Dampers Ready
Delta Temp. Low
Delta Temp. Okay
Chill Active
422
Chill Active
424
Time td expired

Fig. 12



Initialization: Shuts off heater and turns on fan. This mode is implemented so that the customer interface LED that is wired in parallel with the fan will turn on as soon as the button is hit. Time ti is the initialization time and will typically be approximately one minute.

Pos. Dampers: This state shuts off the fan, sets the single damper open then closes the dual damper. It then turns the fan back on. This is done for power management.

PreHeat: This state regulates the pan temperature

LowHeat

HighHeat:

Terminate: This mode closes both dampers and shuts off the fan then returns to idle.

Fig. 13

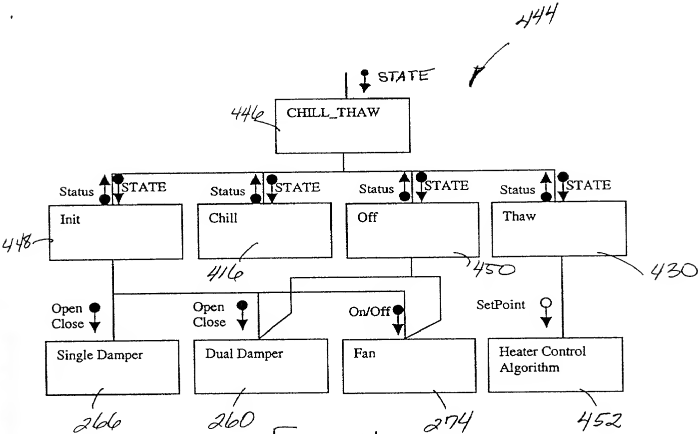


Fig. 14

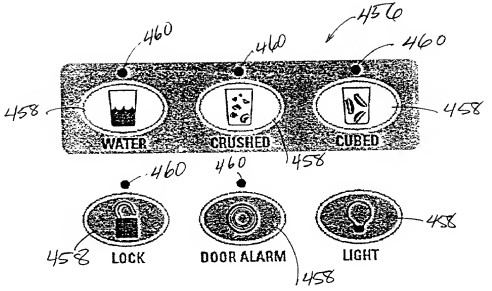


FIG. 15

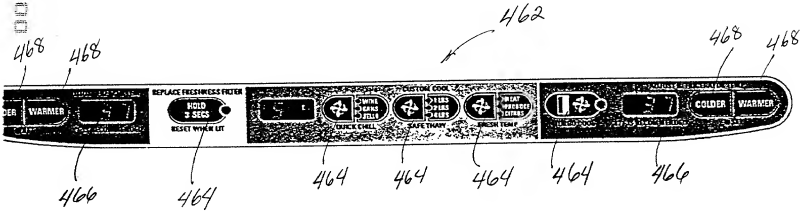


FIG. 16

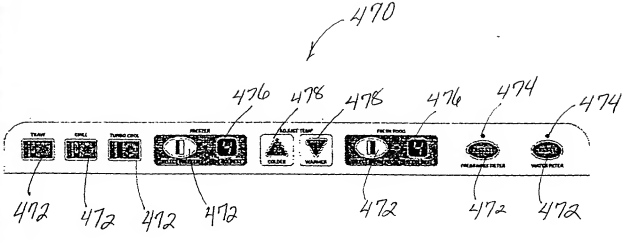
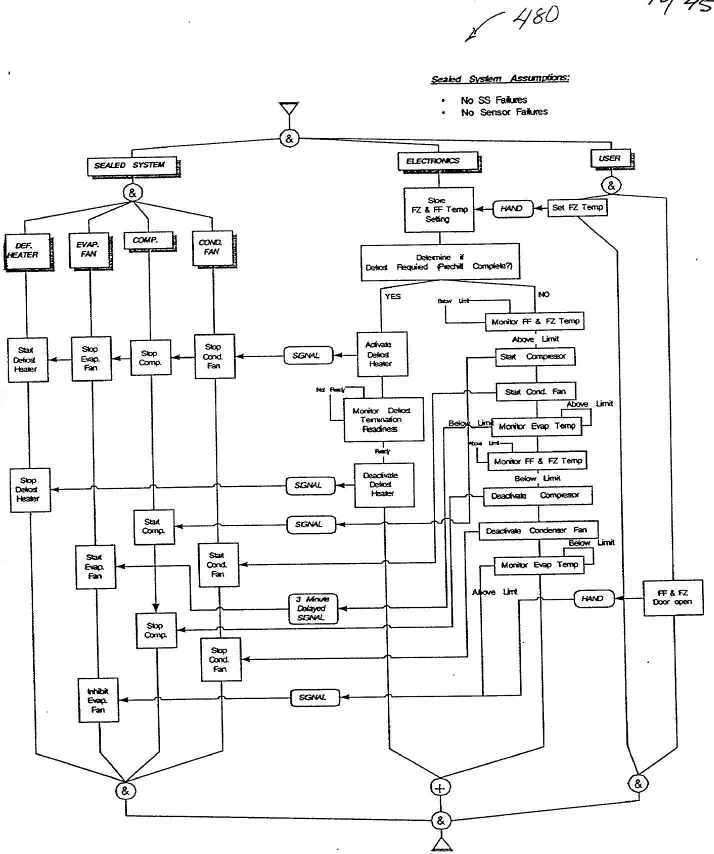
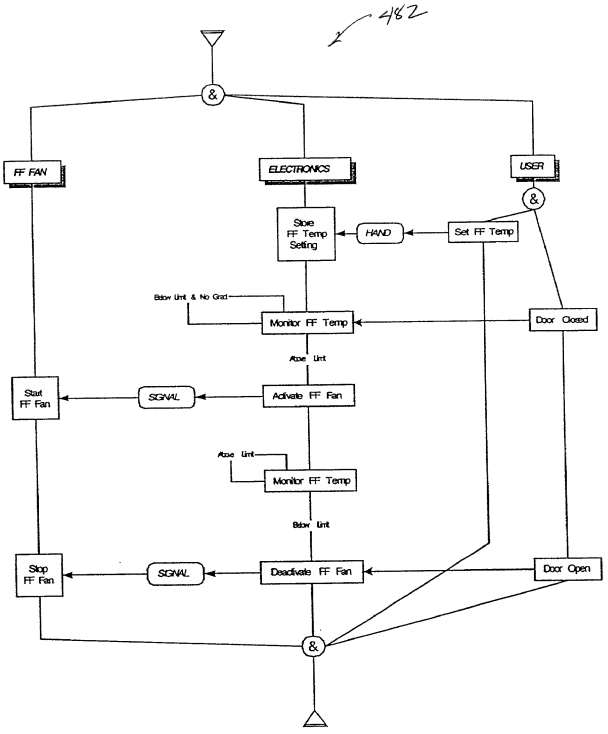


Figure 17.


480
Sealed System Assumptions:
• No SS Failures
• No Sensor Failures
SEALED SYSTEM
ELECTRONICS
USER
DEF. HEATER
EVAP. FAN
COMP.
COND. FAN
Store FZ & FF Temp Setting
HAND
Set FZ Temp
Determine if Defrost Required (Prechill Complete?)
YES
NO
Below Limit
Monitor FF & FZ Temp
Above Limit
Start Defrost Heater
Stop Evap. Fan
Stop Comp.
Stop Cond. Fan
SIGNAL
Activate Defrost Heater
Start Compressor
Start Cond. Fan
Not Ready
Monitor Defrost Termination Readiness
Ready
Monitor Evap Temp
Below Limit
Above Limit
Stop Defrost Heater
Deactivate Defrost Heater
Below Limit
Deactivate Compressor
Start Comp.
Deactivate Condenser Fan
Start Evap. Fan
Start Cond. Fan
3 Minute Delayed SIGNAL
Above Limit
FF & FZ Door open
Stop Comp.
Stop Cond. Fan
Inhibit Evap. Fan

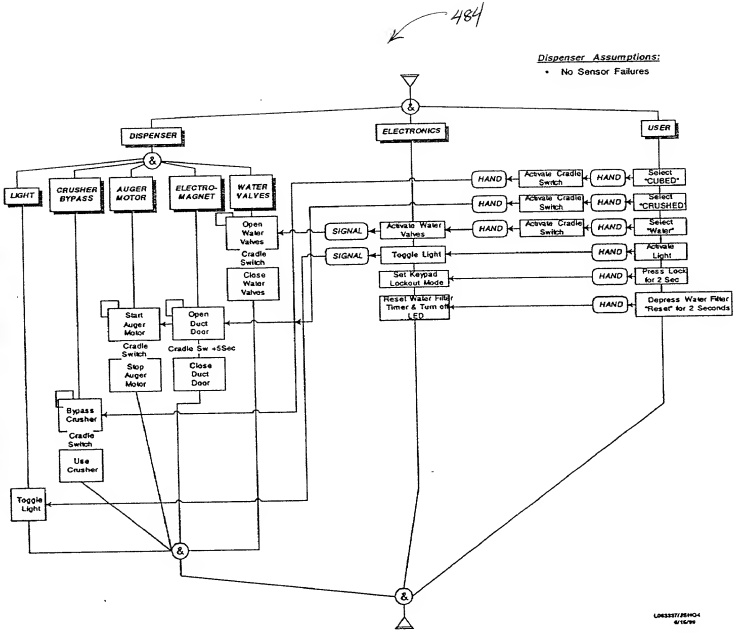
Sealed System Behavior Diagram

Fig 18



Fresh Food Fan Behavior Diagram

Fig 19



Dispenser Behavior

Fig 20

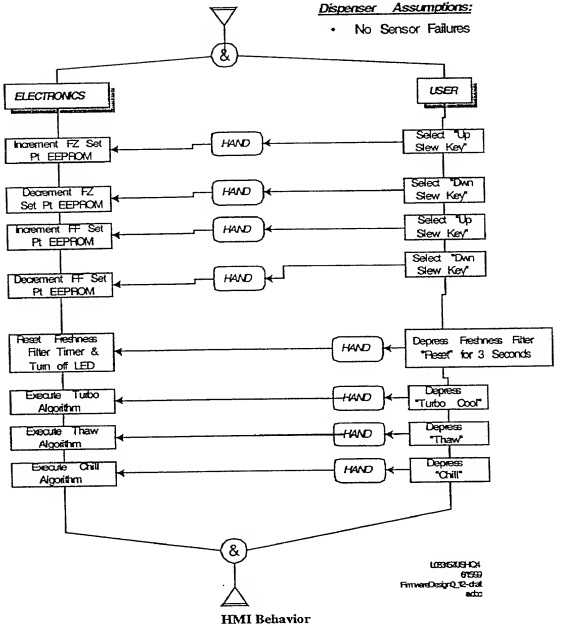
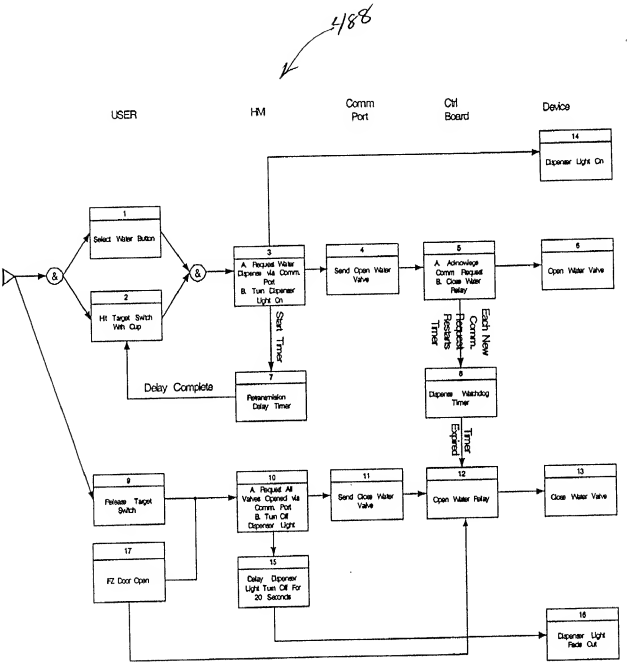
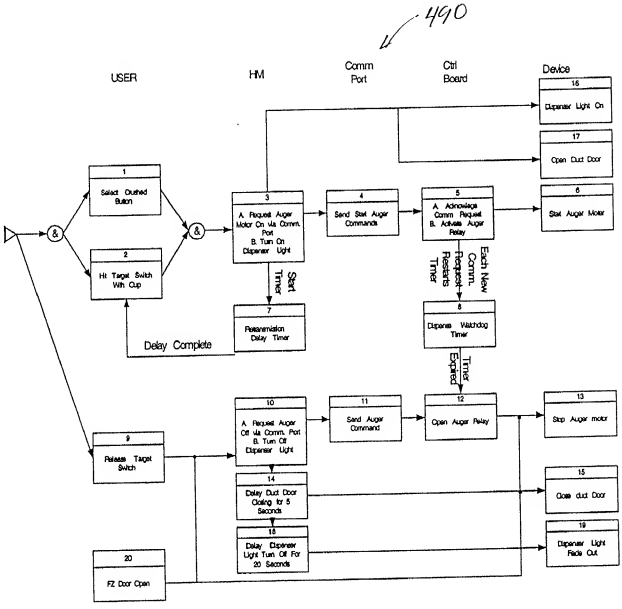


Fig 21



Water Dispenser Interactions

Fig 22

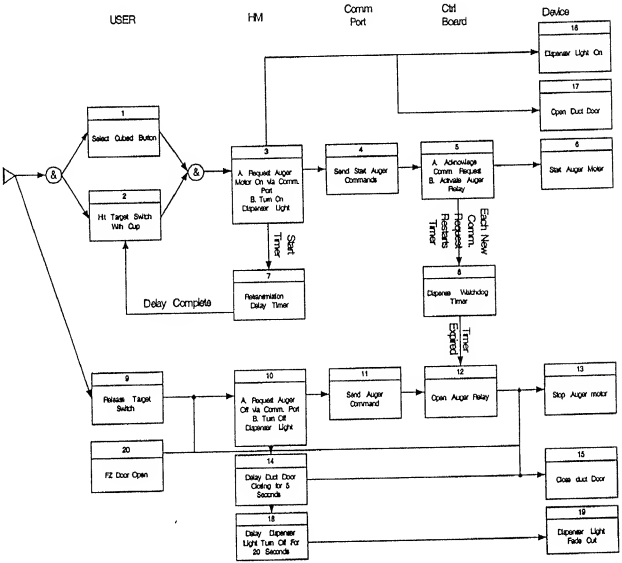


Crushed Ice Dispenser Interactions

Fig 23

8/45

4/92

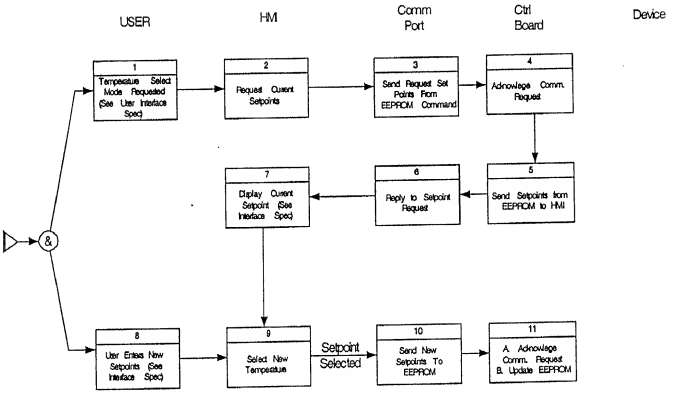


Cubed Ice Dispenser Interactions

Fig 24

08/45

494



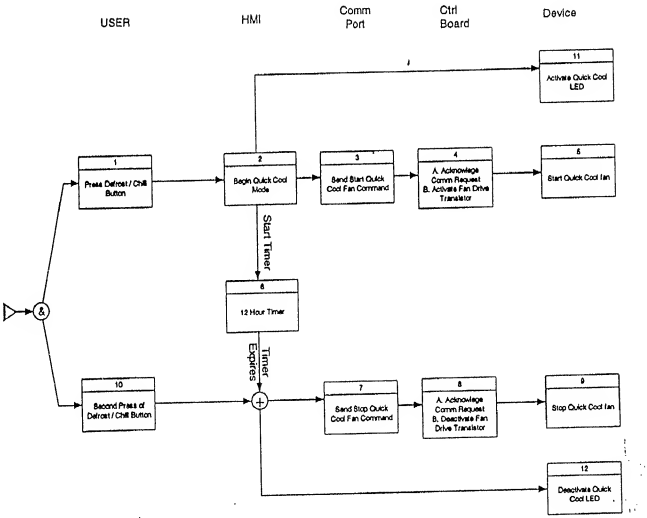
NOTE: Setpoint Selected implies that the final selection has been made and that the selection has timed out.

Temperature Setting Interaction Diagrams

Fig 25

03/45

496

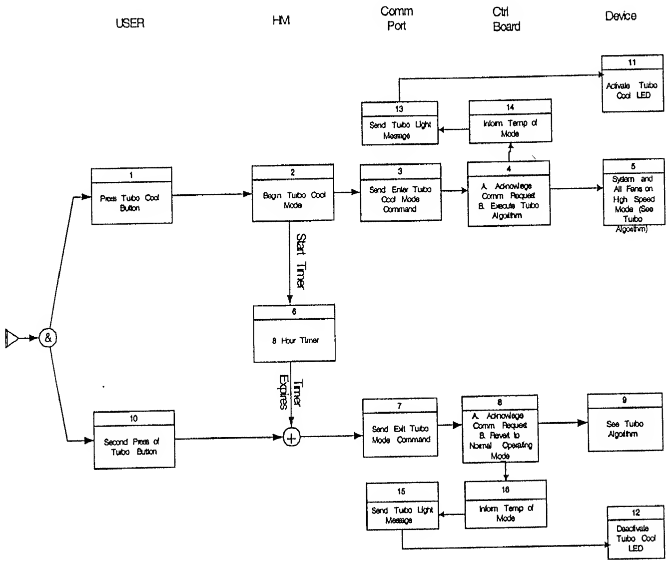


Quick Chill Interaction Diagram

Fig 26

5/7/98

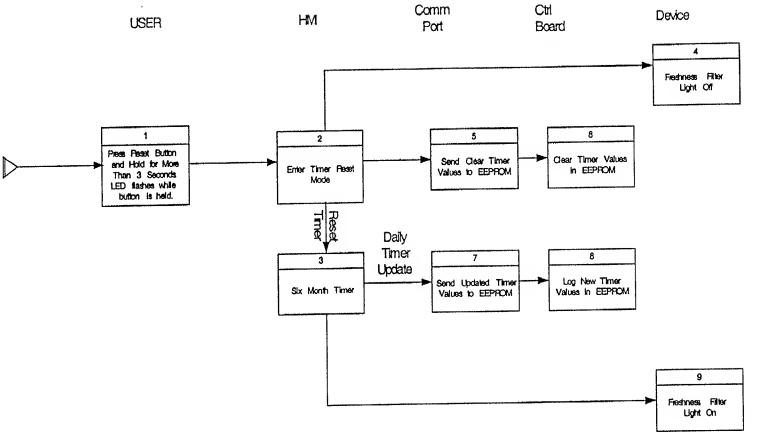
498


USER
HM
Comm Port
Ctrl Board
Device
1 Press Turbo Cool Button
2 Begin Turbo Cool Mode
3 Send Enter Turbo Cool Mode Command
4 A. Acknowlege Comm Request B. Execute Turbo Algorithm
5 System and All Fans on High Speed Mode (See Turbo Algorithm)
11 Activate Turbo Cool LED
13 Send Turbo Light Message
14 Inform Temp of Mode
Start Timer
6 8 Hour Timer
Timer Expires
10 Second Press of Turbo Button
7 Send Exit Turbo Mode Command
8 A. Acknowlege Comm Request B. Revert to Normal Operating Mode
9 See Turbo Algorithm
16 Inform Temp of Mode
15 Send Turbo Light Message
12 Deactivate Turbo Cool LED
&
+

Turbo Mode Interaction Diagram

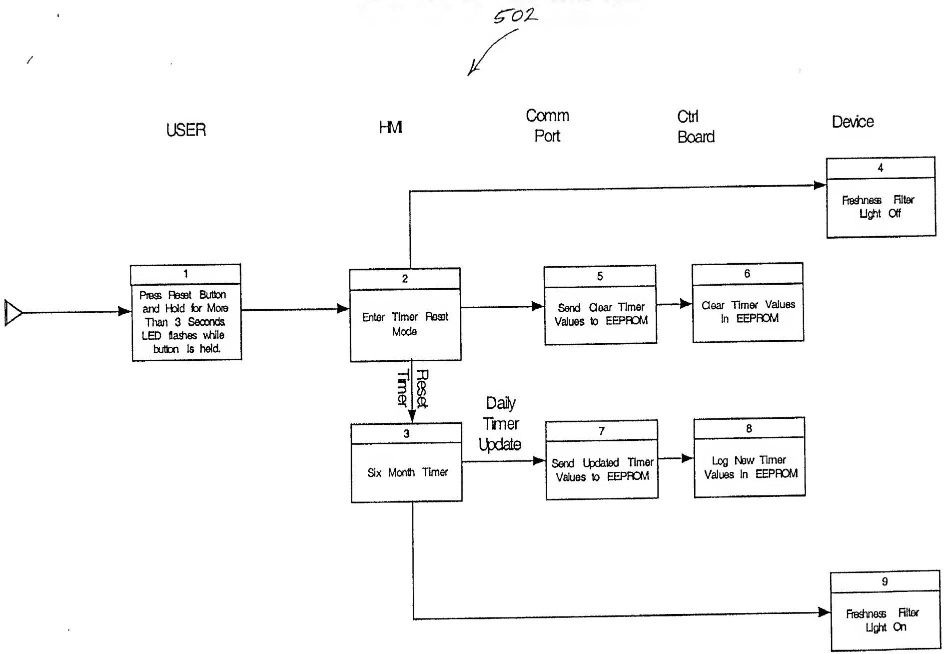
Fig 27

500



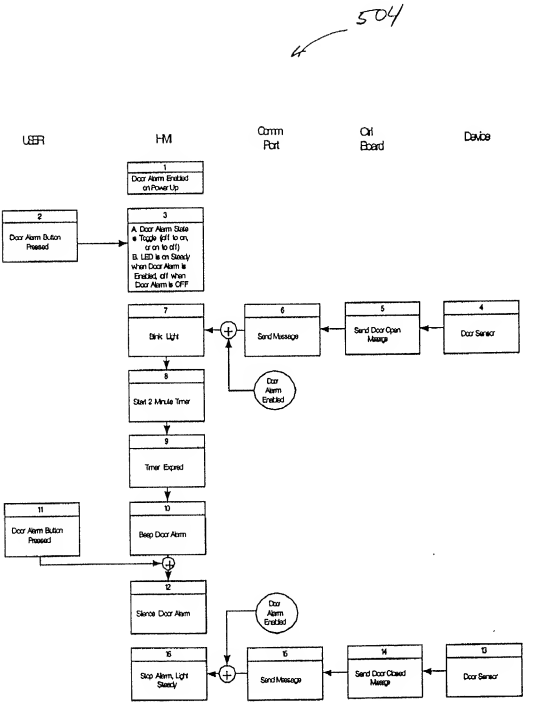
Freshness Filter Reminder Interaction

Fig 28

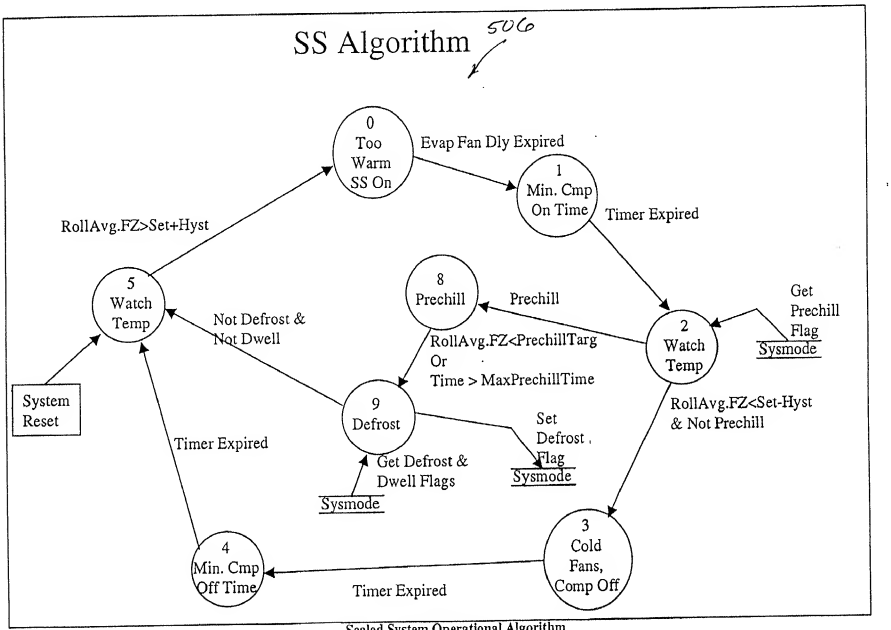


Water Filter Reminder Interaction

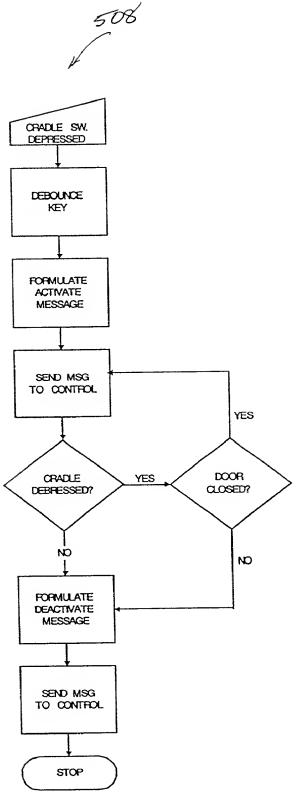
Fig 29



Door Open Interaction Diagram

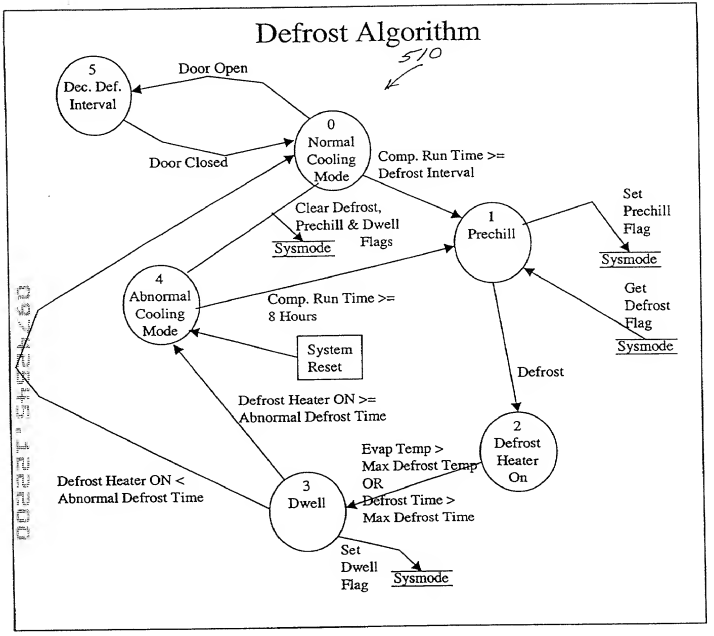


Sealed System Operational Algorithm



Dispenser Control Algorithm

Fig 32



Defrost Control State Diagram

Fig 33

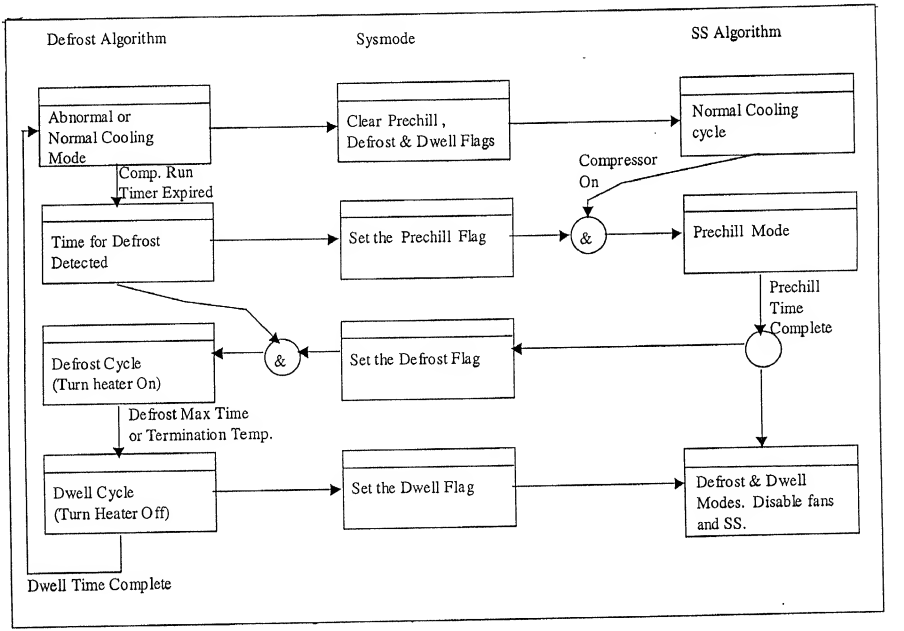
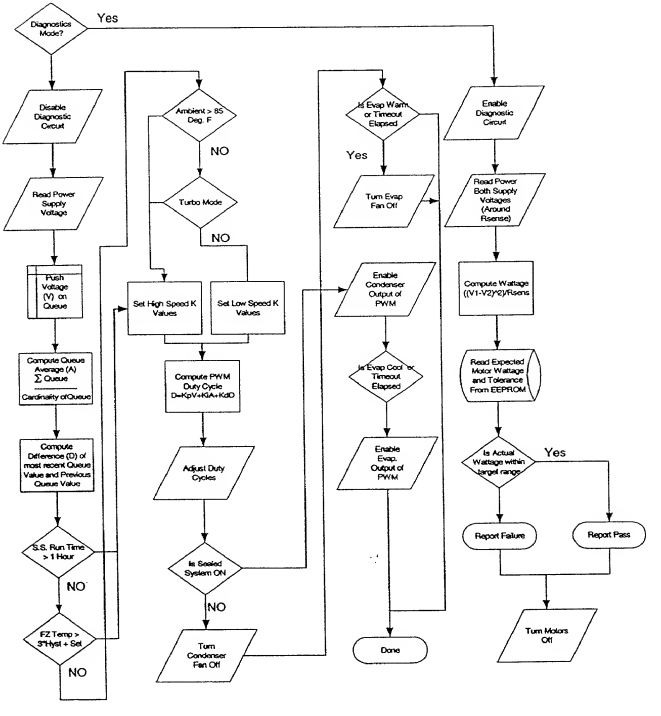

Defrost Algorithm
Sysmode
SS Algorithm
Abnormal or Normal Cooling Mode
Clear Prechill, Defrost & Dwell Flags
Normal Cooling cycle
Comp. Run Timer Expired
Compressor On
Time for Defrost Detected
Set the Prechill Flag
&
Prechill Mode
Prechill Time Complete
Defrost Cycle (Turn heater On)
&
Set the Defrost Flag
Defrost Max Time or Termination Temp.
Dwell Cycle (Turn Heater Off)
Set the Dwell Flag
Defrost & Dwell Modes. Disable fans and SS.
Dwell Time Complete

Fig 34

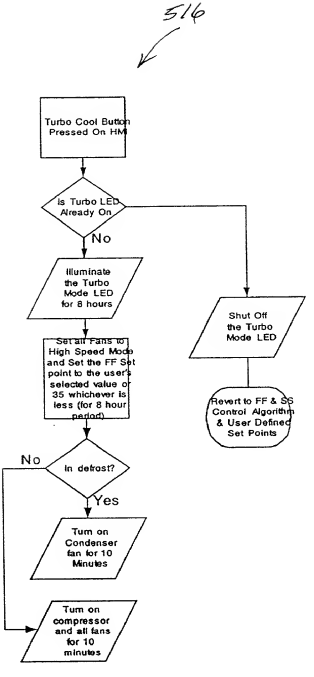
Evap. & Cond. Fan Control:



Fan Speed Control

Notes:
1. The FF & Evaporator fans will shut off for the first five minutes that the door is open.
2. Only one fan at a time can be on at a time during diagnostics.
3. Once the fan has been switched to high speed, it remains in that state until the operational cycle is complete.

FIG. 35

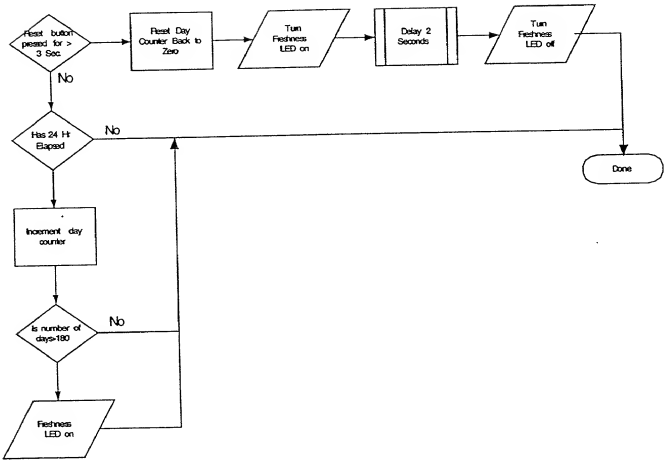


TURBO CYCLE ALGORITHM

Fig 36

518

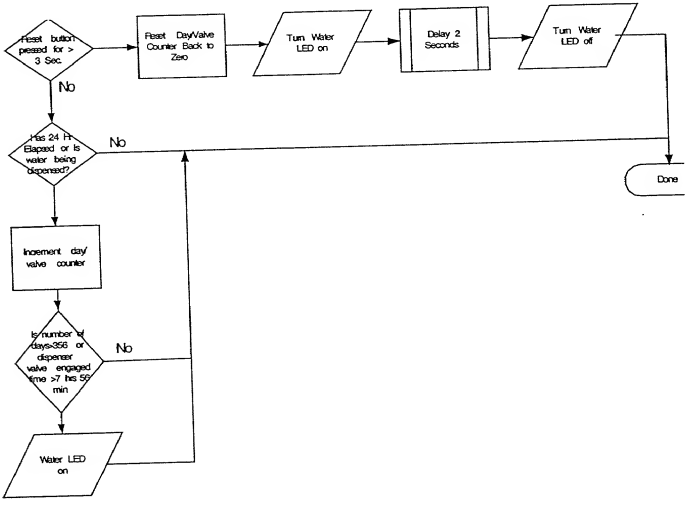
Change Freshness Filter:



Freshness Filter Reminder Algorithm

Fig 37

520

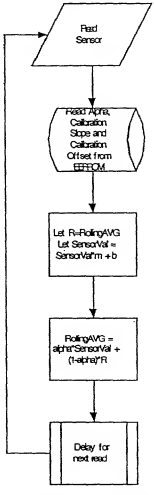


Water Filter Reminder Algorithm

Fig 38

522

SENSOR READ AND ROLLING AVERAGE ALGO:



Sensor Reading Algorithm

NOTE:
Fresh food average uses this algorithm twice to create a 2nd pole filter.

Fig 39

524

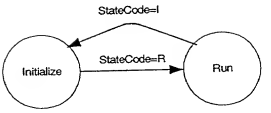


Fig. 40

526

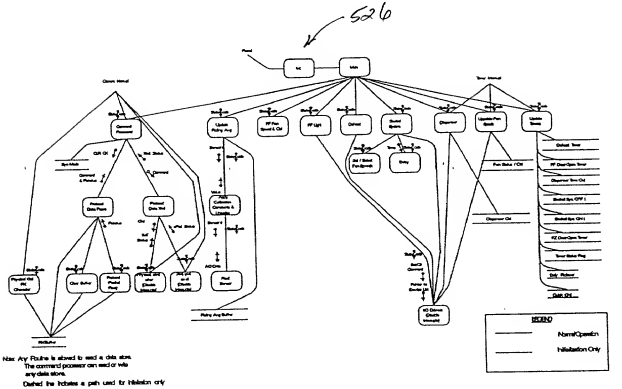
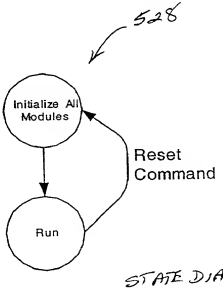


Fig. 41



STATE DIAGRAM FOR MAIN CONTROL

Fig. 42

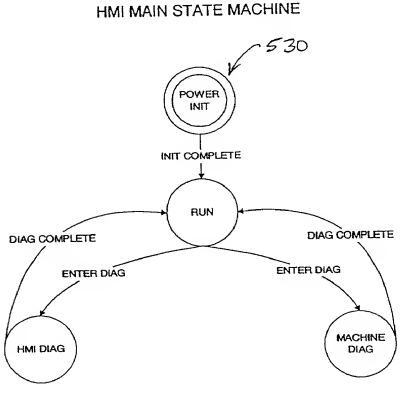
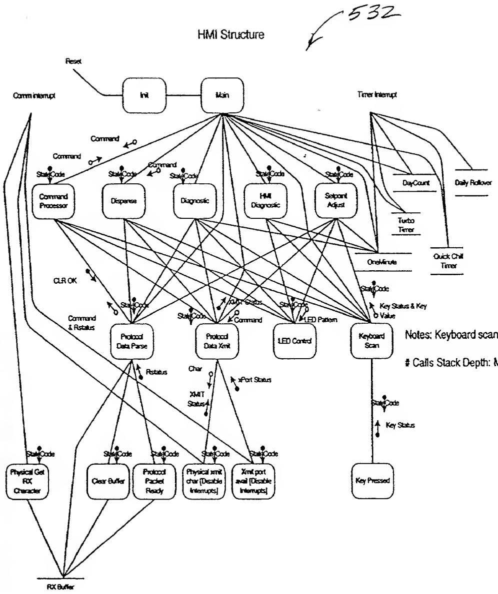


Fig. 43


532
HMI Structure
Reset
Init
Main
Comm interrupt
Timer Interrupt
Command
Command
Command
StateCode
Command Processor
Dispense
Diagnostic
HMI Diagnostic
Setpoint Adjust
DayCount
Daily Rollover
Turbo Timer
OneMinute
Quick Chill Timer
CLR OK
Command & Rstatus
XMIT Status
Command
LED Pattern
Key Status & Key Value
Protocol Data Parse
Protocol Data Xmit
LED Control
Keyboard Scan
Rstatus
Char
xPort Status
XMIT Status
Key Status
Physical Get RX Character
Clear Buffer
Protocol Packet Ready
Physical xmit char [Disable Interrupts]
Xmit port avail [Disable Interrupts]
Key Pressed
RX Buffer

Notes: Keyboard scan should return the last key hit and whether a key is presently being pressed.
Calls Stack Depth: Main->Diag->Keyboardscan-> KeyPressed->Com Interrupt -> Physical get character

Fig. 44

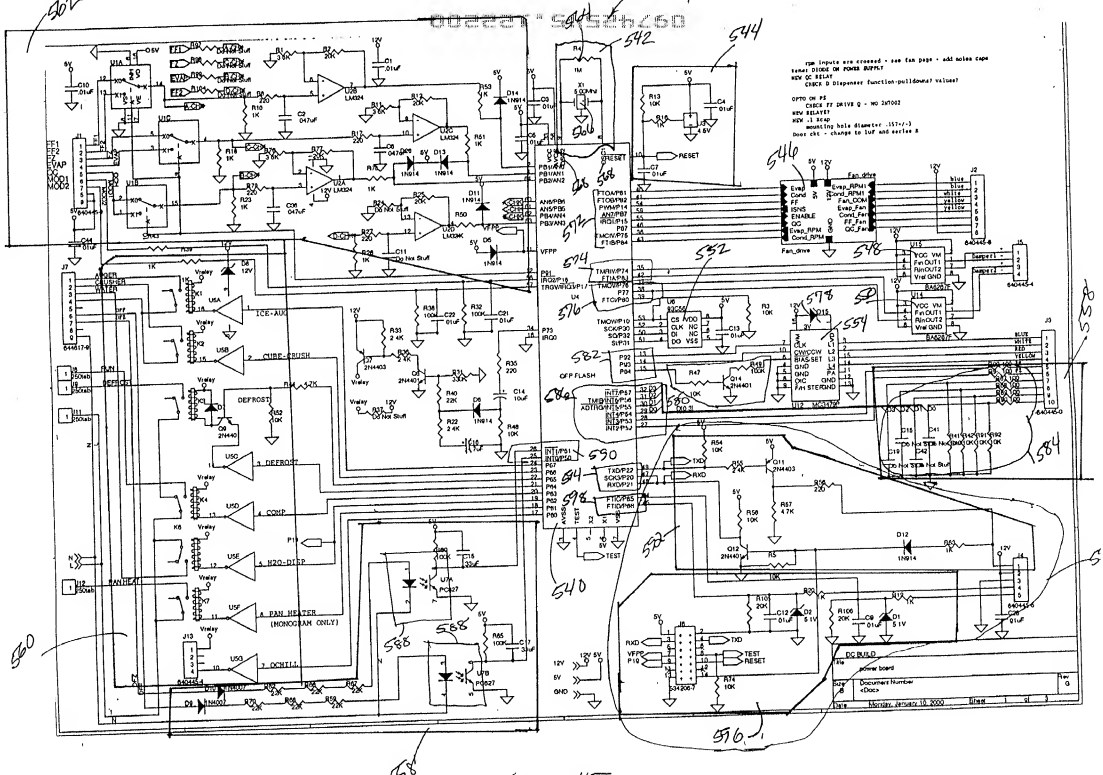


FIGURE 4/5

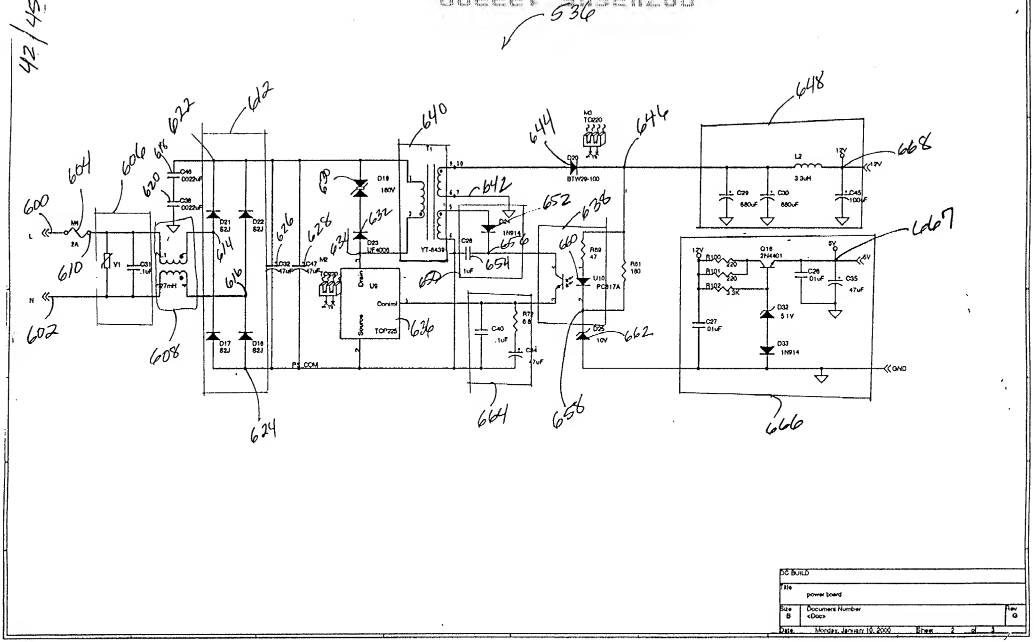
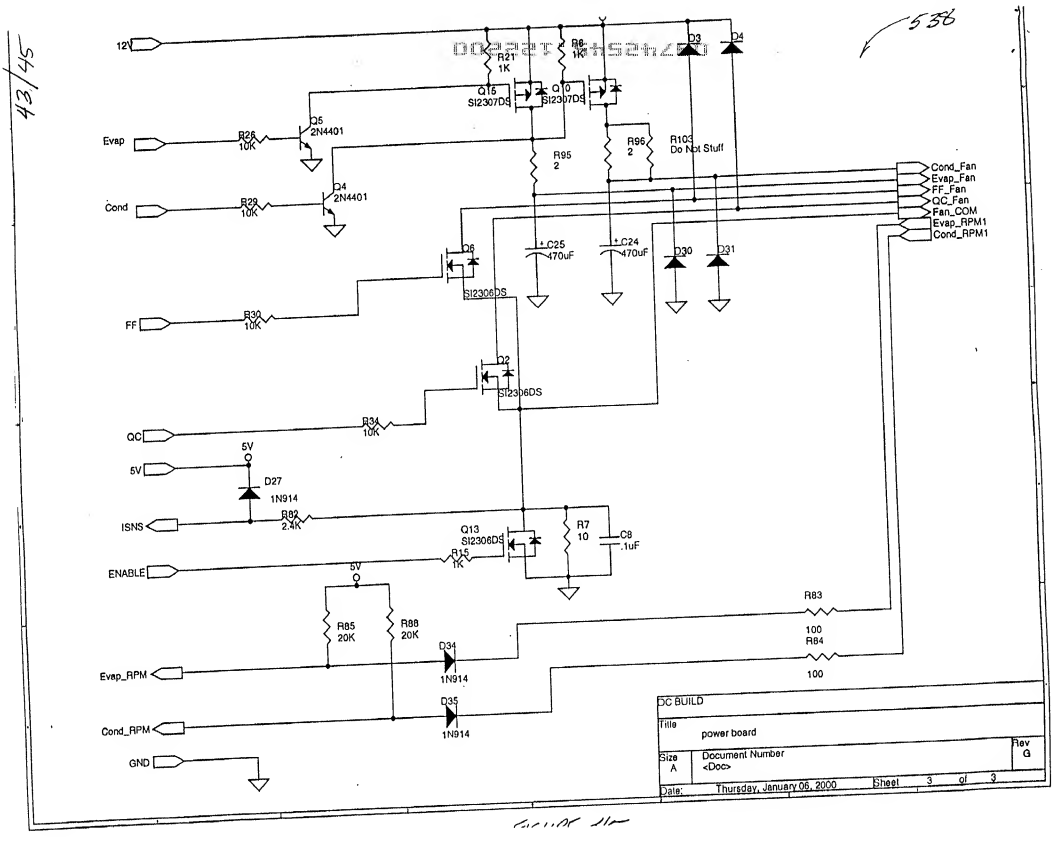

536
600
602
604
606
608
610
612
614
616
618
620
622
624
626
628
630
632
634
636
638
640
642
644
646
648
650
652
654
656
658
660
662
664
666
667
668
L
N
M4
2A
V1
C31
.1uF
27mH
C46
C38
D21
B2J
D22
B2J
D17
B2J
D16
B2J
C32
47uF
C47
47uF
M2
PS_COM
D19
180V
D23
UF4006
U9
Drain
Control
Source
TOP225
T1
YT-8439
D20
BTW29-100
M3
TO220
D24
1N914
C28
1uF
C40
.1uF
R72
6.8
C44
47uF
R69
47
U10
PC817A
R61
180
D25
10V
C29
680uF
C30
680uF
L2
3.3uH
C45
100uF
12V
R100
220
R101
220
R102
3.3K
Q16
2N4401
C27
.01uF
C26
.01uF
C35
47uF
D32
5.1V
D33
1N914
5V
GND
DC BUILD
Title
power board
Size
B
Document Number
<Doc>
Rev
G
Date
Monday, January 10, 2000
Sheet
2
of
3

FIGURE 45


12V
R21 1K
R6 1K
Q15 SI2307DS
Q10 SI2307DS
D3
D4
Evap
R26 10K
Q5 2N4401
R95 2
R96 2
R103 Do Not Stuff
Cond
R29 10K
Q4 2N4401
Cond_Fan
Evap_Fan
FF_Fan
QC_Fan
Fan_COM
Evap_RPM1
Cond_RPM1
D6
SI2306DS
C25 470uF
C24 470uF
D30
D31
FF
R30 10K
Q2
SI2306DS
QC
R31 10K
5V
5V
D27
1N914
ISNS
R82 2.4K
Q13 SI2306DS
R7 10
C8 .1uF
ENABLE
R15 1K
5V
R85 20K
R88 20K
R83 100
R84 100
Evap_RPM
D34 1N914
Cond_RPM
D35 1N914
GND
DC BUILD
Title
power board
Size A
Document Number <Doc>
Rev G
Date: Thursday, January 06, 2000
Sheet 3 of 3

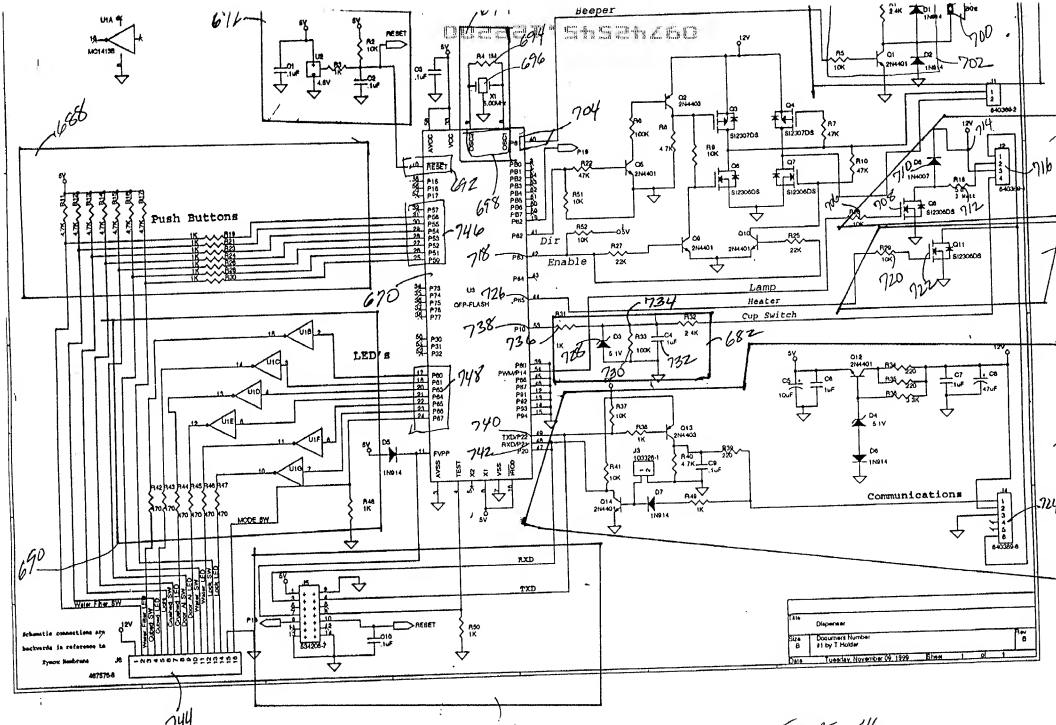


FIGURE 46

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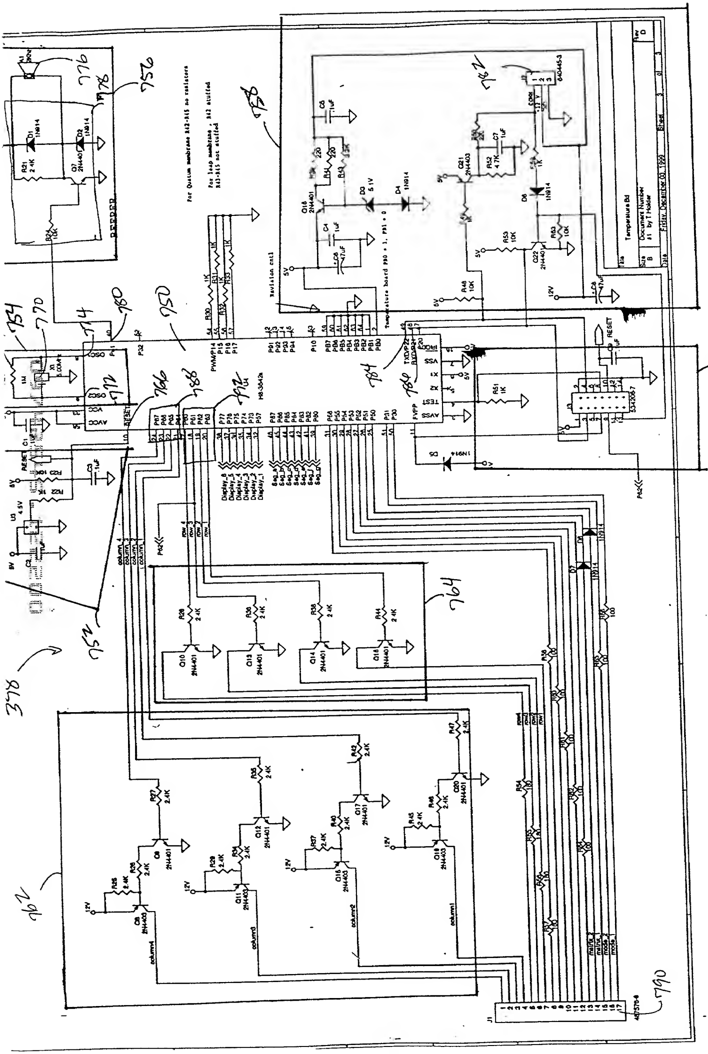

FIGURE 47